Claims

1. A data structure, tangibly embodied in a computer-readable medium, representing a polymer of chemical units, the data structure comprising:

an identifier including one or more fields, each field for storing a value corresponding to one or more properties of the polymer,

wherein at least one field stores a non-character-based value.

2. The data structure of claim 1, wherein each of the fields is capable of storing a binary value.

3. The data structure of claim 1, wherein the identifier is representable as a single-digit hexadecimal number.

4. The data structure of claim 1, wherein the identifier is representable as a decimal value.

5 The data structure of claim 4, wherein the decimal value may be reduced to a plurality of prime divisors, wherein each prime divisor represents a building block of the polymer.

6. The data structure of claim 1, wherein the polymer of chemical units comprises a polysaccharide and wherein each of the chemical units is a saccharide.

7. The data structure of claim 1, wherein the polymer of chemical units comprises a nucleic acid and wherein each of the chemical units is a nucleotide.

8. The data structure of claim 1, wherein the polymer of chemical units comprises a polypeptide and wherein each of the chemical units is an amino acid.

9. The data structure of claim 1, wherein the one or more properties comprise one or more chemical unit properties, each chemical unit property being a property of one of the chemical units of the polymer.

10. The data structure of claim 9, wherein the one or more properties comprise one or more charges, each charge being a charge of one of the chemical units of the polymer.

11. The data structure of claim 9, wherein the one or more properties comprise one or more chemical unit identities, each chemical unit identity being an identity of a chemical unit of the polymer.

12. The data structure of claim 9, wherein the one or more properties comprise one or more confirmations, each confirmation being a confirmation of a chemical unit of the polymer.

13. The data structure of claim 9, wherein the one or more properties comprise one or more substituent identities, each substituent identity being an identity of a substituent of a chemical unit of the polymer.

14. The data structure of claim 1, wherein the one or more properties comprise one or more properties of the polymer.

15. The data structure of claim 14, wherein the one or more properties comprise a total charge of the polymer.

16. The data structure of claim 14, wherein the one or more properties comprise a total number of sulfates of the polymer.

17. The data structure of claim 14, wherein the one or more properties comprise a dye-binding of the polymer.

18. The data structure of claim 14, wherein the one or more properties comprise one or more properties of a polysaccharide.

19 The data structure of claim 18, wherein the one or more properties of a polysaccharide include one or more compositional ratios of substituents.

20. The data structure of claim 18, wherein the one or more properties of a polysaccharide include one or more compositional ratios of iduronic versus glucuronic.

21. The data structure of claim 18, wherein the one or more properties of a polysaccharide include enzymatic sensitivity.

22. The data structure of claim 14, wherein the one or more properties comprise a mass of the polymer.

23. The data structure of claim 14, wherein the one or more properties comprise degree of sulfation.

24. The data structure of claim 14, wherein the one or more properties comprise charge.

25. The data structure of claim 14, wherein the one or more properties comprise chirality.

26. The data structure of claim 1, wherein the identifier comprises a numerical identifier.

27. A computer-implemented method for generating a data structure, tangibly embodied in a computer-readable medium, representing a polymer of chemical units, the method comprising an act of:

generating an identifier including one or more fields for storing values, each value corresponding to one or more properties of the polymer,

wherein at least one field stores a non-character-based value.

28. A computer-implemented method for determining whether properties of a query sequence of chemical units match properties of a polymer of chemical units, the query sequence being represented by a first data structure, tangibly embodied in a computer-readable medium, including an identifier that includes one or more fields, each field storing a value corresponding to one or more properties of the query sequence, the polymer being represented by a second data structure, tangibly embodied in a computer-readable medium, including an identifier that includes one or more fields, each field for storing a value corresponding to one or more properties of the polymer, the method comprising acts of:

(A) generating at least one mask based on the values stored in the one or more fields of the first data structure;

(B) performing at least one binary operation on the values stored in the one or more fields of the second data structure using the at least one mask to generate at least one result; and

(C) determining whether the one or more properties of the query sequence match the one or more properties of the polymer based on the at least one result.

29. The method of claim 28, wherein each of the one or more fields of the first and second data structures is a bit field.

30. The method of claim 28, wherein the act (A) comprises an act of:

(A)(1) generating the at least one mask as a sequence of bits that is equivalent to the values stored in the fields of the first data structure.

31. The method of claim 28, wherein the act (A) comprises an act of:

(A)(1) generating the at least one mask as a sequential repetition of the values stored in the fields of the first data structure.

32. The method of claim 28, wherein the at least one mask comprises a plurality of masks and wherein the act (B) comprises acts of:

(B)(1) performing a logical AND operation on the values stored in the fields of the second data structure using each of the plurality of masks to generate a plurality of intermediate results; and

(B)(2) combining the plurality of intermediate results using at least one logical OR operation to generate the at least one result.

33. The method of claim 28, wherein the act (C) comprises an act of:

(C)(1) determining that the one or more properties of the query sequence match the one or more properties of the polymer when the at least one result has a non-zero value.

34. The method of claim 28, wherein the at least one binary operation comprises at least one logical AND operation.

35. A database, tangibly embodied in a computer-readable medium, for storing information descriptive of one or more polymers, the database comprising:

one or more data units corresponding to the one or more polymers, each of the data units including an identifier that includes one or more fields, each field for storing a value corresponding to one or more properties of the polymer.

36. A method for determining whether complete building blocks of a query sequence of chemical units match complete building blocks of a polysaccharide, the query sequence being represented by a first data structure, tangibly embodied in a computer-readable medium, including an identifier that includes one or more fields, each field for storing a value corresponding to a complete building block of the query sequence, the polysaccharide being represented by a second data structure, tangibly embodied in a computer-readable medium, including an identifier that includes one or more fields, each field for storing a value corresponding to a complete building block of the polysaccharide, the method comprising acts of:

(A) generating at least one mask based on the values stored in the one or more fields of the first data structure;

(B) performing at least one binary operation on the values stored in the one or more fields of the second data structure using the at least one mask to generate at least one result; and

(C) determining whether the complete building blocks of the query sequence match the complete building blocks of the polysaccharide based on the at least one result.

37. The method of claim 36, wherein each of the one or more fields of the first and second data structures is a bit field.

38. A data structure, tangibly embodied in a computer-readable medium, representing a polysaccharide, the data structure comprising:

an identifier including one or more fields, each field for storing a value corresponding to a complete building block of the polysaccharide.

39. The data structure of claim 38, wherein each of the one or more fields are capable of storing a binary value.

40. The data structure of claim 38, wherein the identifier is representable as a single-digit hexadecimal number.

41. The data structure of claim 38, wherein the identifier is representable as a decimal value.

42 The data structure of claim 41, wherein the decimal value can be reduced to a plurality of prime divisors, wherein each prime divisor represents a building block of the polysaccharide.

43. A data structure, tangibly embodied in a computer-readable medium, representing a chemical unit of a polymer, the data structure comprising:

an identifier including one or more fields, each field for storing a value corresponding to one or more properties of the chemical unit,

wherein at least one field stores a non-character-based value.

44. The data structure of claim 43, wherein the one or more properties include a charge of the chemical unit.

45. The data structure of claim 43, wherein the one or more properties include an identity of the chemical unit.

46. The data structure of claim 43, wherein the one or more properties include a confirmation of the chemical unit.

47. The data structure of claim 43, wherein the one or more properties include an identity of a substituent of the chemical unit.

48 The data structure of claim 43, wherein each of the fields is capable of storing a binary value.

49. The data structure of claim 43, wherein the identifier is representable as a single-digit hexadecimal number.

50. The data structure of claim 43, wherein the identifier is representable as a decimal value.

51 The data structure of claim 50, wherein the decimal value is a primary number.

52. The data structure of claim 51, wherein the polymer is a polysaccharide, and the primary number identifies the chemical unit as a building block of the polysaccharide.

53. The data structure of claim 43, wherein the polymer is a polysaccharide.